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(54) **SOLE AND SHOE COMPRISING SAID SOLE**

(57) It consists of a sole, apt to improve walking, and footwear including said sole, thus made more comfortable, high-performance, and flexible.

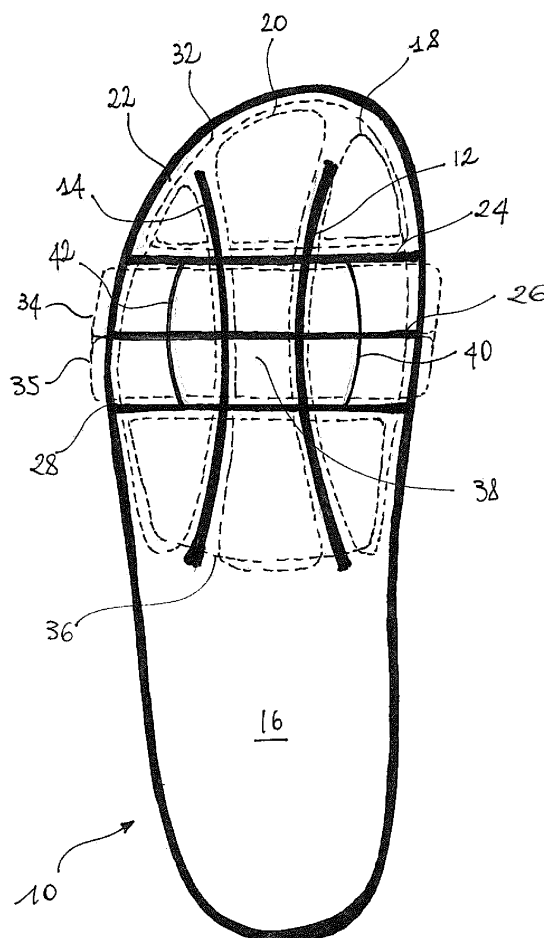


Fig. 1

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Description

[0001] The present invention relates to a sole and footwear comprising said sole. More specifically, it relates to a sole apt to improve walking, and to footwear comprising said sole, thus made more comfortable and performing.

[0002] As is well known, in the footwear industry on the one hand there is a tendency to make footwear that is increasingly comfortable and at the same time performs better.

[0003] However, this need must also take into account the market demand for inexpensive footwear, thus at the expense of the quality of the final product.

[0004] In an attempt to combine economic needs and footwear quality, products have been placed on the market that do not fully satisfy the user.

[0005] There are, in fact, footwear that includes particularly rigid soles that make the various stages of walking uncomfortable.

[0006] Such footwear, if on the one hand they seem to give correct support to the foot, at least when it is stationary, on the other hand, however, they even make the bending phase of the foot more difficult.

[0007] All of which causes significant foot fatigue during walking.

[0008] In order to solve these problems, soles can be made of softer materials, but these give less support to the foot.

[0009] Alternatively, higher-quality materials are used, which, while providing excellent performance, nevertheless increase the final cost of the footwear. The purpose of the invention is to obviate the aforementioned drawbacks and others by providing a sole, and consequently a footwear comprising said sole, that act on the foot with both a supportive action and facilitating foot flexion. Another purpose of the invention is to provide a sole and footwear that does not fatigue the foot during walking.

[0010] A further purpose of the invention is to provide a sole and footwear that is cost-effective while providing comfort and high performance.

[0011] These purposes and advantages are all achieved, according to the invention, by a shoe sole as per claim 1.

[0012] In detail, said sole includes a toe, a middle portion, and a back edge, so as to define a front portion between the toe and the middle portion, and a back portion between the middle portion and the back edge. The sole has a contact surface with the ground.

[0013] Specifically, a first longitudinal groove and a second longitudinal groove are made on the contact surface, which develop from the toe to the middle portion of the sole.

[0014] Thus, a right front portion, a middle front portion and a left front portion are identified on the contact surface of the sole in addition to the rear portion.

[0015] Through this solution, the flexibility of the front portion of the sole is improved; in particular, this flexibility is provided in the longitudinal direction. At the same time,

the rear portion of the sole, not being affected by the longitudinal grooves, ensures full heel support.

[0016] The first longitudinal groove and the second longitudinal groove have an arcuate profile and are arranged symmetrical to each other, thus assisting any torsional movements of the foot.

[0017] Furthermore, in order to achieve optimal flexibility in the transverse direction as well. in the front portion, a front transverse groove, a middle transverse groove, and a rear transverse groove are made on the contact surface, so that in the front portion of the sole, a front part, a first middle part, a second middle part, and a rear part can be identified.

[0018] Advantageously, the front transverse groove, center transverse groove, and rear transverse groove can have a straight profile and be parallel to each other, so as to accommodate the bending motion of the sole itself.

[0019] Through this configuration, the transverse flexibility characteristics of the shoe are improved.

[0020] In other words, the sole can flex naturally and analogously to the rolling of the foot during walking.

[0021] In addition, additional grooves can be made, positioned anteriorly and/or posteriorly to the three transverse grooves front, middle and rear, so as to provide more flexibility should the material used or the structure of the sole itself require it.

[0022] Advantageously, a central element having a rough surface may be included in the sole, so as to improve the grip of the sole itself on the ground.

[0023] In order to ensure adherence precisely at the position where the foot needs support in the phase of its own lifting, the center element may be arranged in the first middle part and the second middle part of the sole.

[0024] The center element may be substantially quadrangular in shape, so as to extend longitudinally and increase the grip surface.

[0025] In addition, the central element may be defined anteriorly by the front transverse groove, posteriorly by the rear transverse groove, and laterally by a right and a left groove, respectively.

[0026] In particular, the right groove and the left groove can be curved and symmetrical to each other along a longitudinal axis, so as to make a central element with a perimeter edge having a similar course to the edge of the sole, so as to provide more grip.

[0027] The central element may be made of a different material from that of the remaining part of the sole, in order to obtain on the sole parts with peculiar characteristics according to their respective different functions.

[0028] And with the same purpose, the back portion, the right front portion, the center front portion, and the left front portion can be made of at least two different materials.

[0029] Advantageously, the central element can be crossed by the central transverse groove, so as to improve the flexibility of the central element itself.

[0030] The purposes and advantages are all likewise

achieved, according to the invention, by a shoe comprising a sole as previously defined.

[0031] Further features and details of the invention may be better understood from the following description, given as a non-limiting example, as well as from the accompanying drawing board in which:

fig. 1 is a schematic view from above of a sole, according to the invention.

[0032] With reference to the attached figure, 10 denotes a sole suitable for placement in a shoe to impart comfort and high performance.

[0033] The sole 10 is made of rubber, but may alternatively consist of other plastic or natural materials, such as leather.

[0034] A first longitudinal groove 12 and a second longitudinal groove 14 are made in the sole 10, particularly on the surface that contacts the ground, and these are carried substantially from just below the toe of the sole 10 to its middle part. The first longitudinal groove 12 and the second longitudinal groove 14 have an arcuate profile and are arranged symmetrical to each other.

[0035] In sole 10 it is, thus, possible to identify a single posterior portion 16 on which the heel rests, while anteriorly the sole is divided by the first longitudinal furrow 12 and the second longitudinal furrow 14 into a right anterior portion 18, a middle anterior portion 20 and a left anterior portion 22.

[0036] The first longitudinal groove 12 and the second longitudinal groove 14 provide some flexibility to the front portion of the sole; in particular, this flexibility is provided in the longitudinal direction.

[0037] In other words, in addition to the flexibility related to the inherent characteristics of the material used to make the sole 10, the right front portion 18, the middle front portion 20, and the left front portion 22 can flex more easily than each other due to the presence of the longitudinal grooves 12, 14. This flexibility in the longitudinal direction allows the foot to be able to rest more comfortably and naturally on the ground, allowing a kind of minimal rotation of the foot around a longitudinal axis of the shoe.

[0038] The support of the sole, and thus of the foot, on the ground can thus occur evenly from left to right or right to left, respecting the normal roll of the foot during walking.

[0039] In addition, the rear portion 16 of the sole, being unaffected by the first longitudinal groove 12 and the second longitudinal groove 14, ensures full heel support, both when the foot is in motion and when it is resting on the ground.

[0040] In the front portion of sole 10, particularly on the surface that contacts the ground, there are, in addition, a front transverse groove 24, a middle transverse groove 26, and a rear transverse groove 28, all of which run from the right edge to the left edge of sole 10.

[0041] The front transverse groove 24, the middle transverse groove 26, and the rear transverse groove 28 all have a straight profile and are parallel to each other.

[0042] The front portion of sole 10 is thus also divided transversely by the three transverse grooves 24, 26, 28.

[0043] Specifically in the front portion of sole 10 are identifiable:

- a front part 32, arranged in front of the front transverse groove 24;
- a first central part 34, arranged between the anterior transverse groove 24 and the central transverse groove 26;
- a second central part 35, adjacent to the first central part 34, arranged between the central transverse groove 26 and the rear transverse groove 28; and
- a rear part 36, arranged behind the rear transverse groove 28.

[0044] The transverse arrangement of the three transverse grooves 24, 26, 28 gives the sole 10, excellent flexibility properties even in the transverse direction.

[0045] In addition, the first central part 34 and the second central part 35 arranged between the front transverse groove 24 and the rear transverse groove 28, are recreated right at the forefoot, specifically the part of the foot that supports the foot itself in its lifting during walking.

[0046] The flexion of the forefoot during walking is thus facilitated and a kind of natural pushing action is created, such that the blood circulation of the foot is improved.

[0047] This prevents the foot from becoming fatigued during walking and also having to tire further to counteract unnecessary sole stiffness as is the case in footwear according to the known technique.

[0048] In addition, in the central part arranged between the three transverse grooves 24, 26, 28, a central element 38 is defined which is basically quadrangular in shape, being laterally circumscribed by a right groove 40 and a left groove 42.

[0049] As per Figure 1, central element 38 extends exactly from anterior transverse groove 24 to posterior transverse groove 28 and is crossed by central transverse groove 26 so that it is longitudinally flexible.

[0050] Central element 38 has a rough surface that gives the sole special grip on the ground. Notably, again, central element 38 is located precisely at the part of the foot (forefoot) that must provide adherence to the ground to give support in the lifting phase of the entire foot.

[0051] The sole thus conformed soles solves the problems of soles according to the known technique and has numerous advantages, including:

- improves all phases of walking;
- supports a natural "roll" in the intermediate step phase;
- gives support but at the same time naturalness to the movement;
- facilitates the flexion phase of the forefoot;
- does not fatigue the foot during walking.

[0052] Variants are possible to be considered within

the scope of protection; According to a variant of the invention, the central element 38 may be made of a different material than the remaining part of the sole, possibly with a higher coefficient of adherence.

[0053] Also, according to a further variant of the invention, the rear portion 16 (even partially), the right front portion 18, the center front portion 20, and the left front portion 22 may be made of two or more different materials, so as to have different elastic properties depending on the functions of the different areas of the sole.

[0054] According to another variation of the invention, additional grooves can be made, positioned anteriorly and/or posteriorly to the three transverse grooves front, middle and rear, so as to provide more flexibility should the material used or the structure of the sole itself require it.

Claims

1. Sole (10) for footwear, comprising a toe, a middle portion, and a rear edge, so as to define a front portion between the toe and the middle portion, and a rear portion (16) between the middle portion and the rear edge, said sole having a contact surface with the ground, wherein on the contact surface there are obtained a first longitudinal groove (12) and a second longitudinal groove (14) developing from the toe to the middle portion of the sole (10), so as to identify on the contact surface of the sole (10) the posterior portion (16), a right anterior portion (18), a middle anterior portion (20) and a left anterior portion (22) and in which the first longitudinal groove (12) and the second longitudinal groove (14) have an arcuate profile and are arranged symmetrical to each other; the sole (10) being **characterized by** the fact that

in the front portion, a front transverse groove (24), a central transverse groove (26) and a rear transverse groove (28) are made on the contact surface, so that in the front portion of the sole (10) a front part (32), a first central part (34), a second central part (35) and a rear part (36) are identified; by the fact that the central transverse groove (26) and the posterior transverse groove (28) have a straight profile and are parallel to each other; and from the fact that a central element (38) having a rough surface is included.

2. Sole (10) according to the preceding claim, wherein the central element (38) is arranged in the first central part (34) and the second central part (35).
3. Sole (10) according to any of the preceding claims, wherein the central element (38) has a substantially quadrangular shape.

4. Sole (10) according to any one of the preceding claims, wherein the central element (38) is of a different material than the remaining part of the sole (10).

5. Sole (10) according to any one of the preceding claims, wherein the central element (38) is defined anteriorly by the front transverse groove (24), posteriorly by the rear transverse groove (28), and laterally by a right groove (40) and a left groove (42) respectively .

6. Sole (10) according to the previous claim, in which the right groove (40) and the left groove (42) are curved.

7. Sole (10) according to the preceding claim, wherein the right groove (40) and the left groove (42) are symmetrical to each other along a longitudinal axis.

8. Sole (10) according to any of the preceding claims, wherein the central element (38) is crossed by the central transverse groove (26).

9. Footwear comprising a sole (10) according to any of the preceding claims.

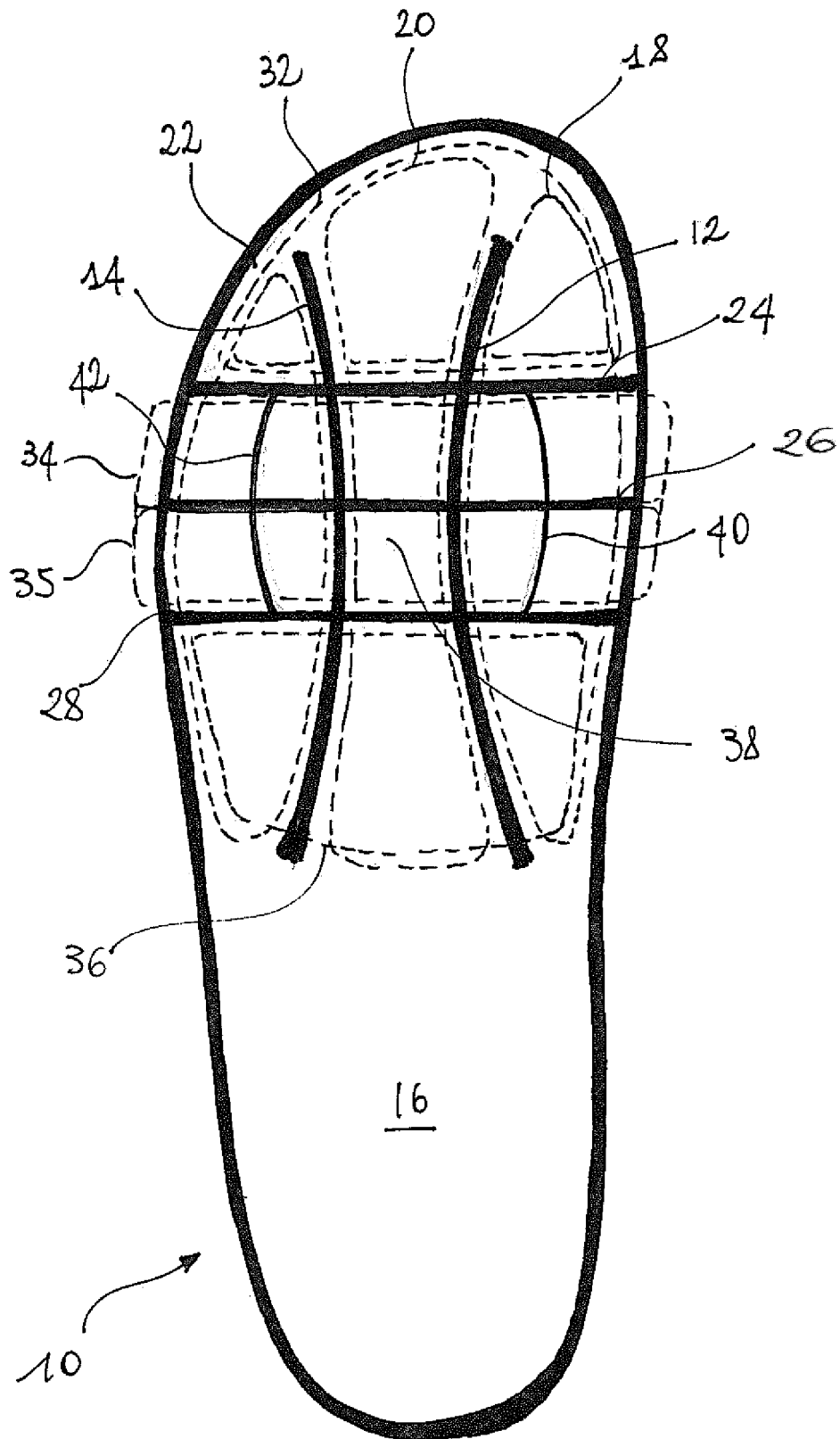


Fig. 1



EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|---|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
| X | US 2013/174444 A1 (JACOBS LAURA M [US] ET AL) 11 July 2013 (2013-07-11) | 1-3, 5-9 | INV. |
| A | * claims; figures * | 4 | A43B13/14 |
| | ----- | | A43B13/16 |
| X | US 2019/110549 A1 (HATFIELD TOBIE D [US] ET AL) 18 April 2019 (2019-04-18) | 1-3, 5-9 | |
| A | * paragraph [0027] - paragraph [0035]; figure 9 * | 4 | |
| | ----- | | |
| X | WO 2011/014146 A1 (AMERICAN SPORTING GOODS CORP [US]; ALVERT ISAAC [US] ET AL.) 3 February 2011 (2011-02-03) | 1-3, 5-9 | |
| A | * paragraph [0027]; claims; figure 1 * | 4 | |
| | ----- | | |
| X | EP 3 607 842 A1 (FLII BERDIN S R L [IT]) 12 February 2020 (2020-02-12) | 1, 3, 4, 8, 9 | |
| A | * paragraph [0052]; claim 1; figure 1 * | 2, 5-7 | |
| | ----- | | |
| | | | TECHNICAL FIELDS SEARCHED (IPC) |
| | | | A43B |
| The present search report has been drawn up for all claims | | | |
| Place of search | | Date of completion of the search | Examiner |
| The Hague | | 29 January 2024 | Chirvase, Lucian |
| CATEGORY OF CITED DOCUMENTS | | | |
| X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document | | T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | |

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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29-01-2024

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| US 2013174444 A1 | 11-07-2013 | NONE | |
| ----- | | | |
| US 2019110549 A1 | 18-04-2019 | CN 102892321 A | 23-01-2013 |
| | | EP 2542108 A1 | 09-01-2013 |
| | | US 2011214313 A1 | 08-09-2011 |
| | | US 2014013623 A1 | 16-01-2014 |
| | | US 2014013626 A1 | 16-01-2014 |
| | | US 2014250729 A1 | 11-09-2014 |
| | | US 2016000182 A1 | 07-01-2016 |
| | | US 2017273401 A1 | 28-09-2017 |
| | | US 2019110549 A1 | 18-04-2019 |
| | | WO 2011109541 A1 | 09-09-2011 |
| ----- | | | |
| WO 2011014146 A1 | 03-02-2011 | NONE | |
| ----- | | | |
| EP 3607842 A1 | 12-02-2020 | EP 3607842 A1 | 12-02-2020 |
| | | ES 2868003 T3 | 21-10-2021 |
| | | PL 3607842 T3 | 15-11-2021 |
| ----- | | | |